Sullivan's Ledge
Wetland Monitoring Report
2001
New Bedford, MA

Prepared for:

Mactec Constructors
Construction division
7000 E. Bellevue Ave.
Greenwood Village, Colorado 80111

Prepared by:

New England Environmental, Inc.
800 Main Street
Amherst, MA 01002
(413) 256-0202

NEE Files: 02-1944/02–1945

NEW ENGLAND ENVIRONMENTAL, INC.

Environmental Consulting Services

800 Main Street
Amherst, MA 01002
(413) 256-0202
FAX (413) 256-1092

March 19, 2002

Mr. Jerry Johnson
Mactec
Construction Division
7000 Bellevue Ave.
Greenwood Village, CO 80111

RE: Sullivan's Ledge, New Bedford, MA
2001 Wetland Maintenance Report
NEE File #: 02-1944 & 02-1945

Dear Jerry:

The following is a Wetland Monitoring Report for work performed at Sullivan's Ledge in New Bedford, Massachusetts during the calendar year 2001. Although the monitoring and maintenance phase of this project officially began on October 1, 2001, on behalf of Mactec New England Environmental, Inc. (NEE) conducted on-going monitoring and maintenance work throughout 2001. This report summarizes the work performed within wetland restoration areas, OU-1 and OU-2 during 2001 and outlines the ongoing work proposed during 2002, the first full year of wetlands maintenance and monitoring. Monitoring reports for the months of October, November, and December 2001 are included.

Due to the increased dominance of invasive plant species within the wetland restoration areas, herbicide treatments were conducted as requested by the EPA to control their spread. The primary invasive plants within the wetlands included Common Cattail, Phragmites, and Purple Loosestrife, although several species of invasive shrubs have also been found. We expect to see significant die-back from the treatments conducted in 2001, however we will be conducting additional herbicide treatments beginning in April, 2002.

This report summarizes the work that was conducted by NEE during 2001 within the wetland restoration areas. Additionally, we have included data from the soil and water analytical samples taken by Mactec. Included in this report is a chronological account of the maintenance activities that occurred over the past year. Photographs of the representative sites have been included for reference of past and existing site conditions. No quantitative vegetative monitoring was performed during 2001. However, the plant monitoring plots have been established, piezometers are in place, and water level staff gages have been installed. We have included in this report a set of revised as-built plans which show the locations of all wetland restoration areas, and monitoring locations. These plans include the locations of the recently installed plant plots, piezometers, and staff gages. It is our intention to refer to these plans during the monitoring

phase of this project.

At the completion of each of the following three years, New England Environmental, Inc. will provide a written report. This report will include information regarding the work performed throughout the year, a Vegetative Monitoring Report, and work intentions for the following year.

Sincerely,
New England Environmental, Inc.

Michael J. Marcus
Senior Scientist
Principal

MJM/sl

enc.

cc: Mr. David Lederer, EPA
Mr. Larry Blue, AVX
Ms. Marilyn Wade, URS
Mr. James Heckathorne, O'Brien & Gere Engineers, Inc.
Mr. D. Dwight, Metcalf & Eddy
Mr. Steven Wood

Sullivan's Ledge
2001 Wetland Monitoring Records

January 26, 2001: General site inspection. Walked site, checked plant material, pruned dead stems. Plants dormant.

February 21, 2001: No snow cover. Conducted dormant seeding of dry mix & moist mix within Haul Road Area, adjacent to OU-2 Adjacent Wetland. Dormant seeding with dry mix spread within area located between OU-1 diversion channel and the un-named stream.

March 28 & 29, 2001: Reviewed plant locations for confirmation of "as-built" site plans. Performed general maintenance within OU-1 and OU-2.

April 30 & May 1, 2001: OU-1 Fairway Pond re-planting. Planted OU-1 Pond with bare root aquatic and emergent plants, installed duck exclusion fencing. Applied additional wetland seed mix (WetMix) to pond shore. The following plants were installed within the OU-1 Fairway Pond:

- **250** *Nymphaea odorata* (weighted tubers)
- **500** *Potamogeton pectinatus* (weighted tubers)
- **1000** *Sagittaria latifolia* (tubers)
- **100** *Pontederia cordata* (root stock)
- **250** *Scirpus validus* (root stock)
- **250** *Acorus calamus* (root stock)
- **150** *Sparganium americanum* (root stock)

May 7, 2001: Performed walk around site inspection throughout all of the OU-1 and OU-2 wetland restoration areas. Pruned dead material, basic maintenance.

May 17, 2001: Performed walk around site inspection throughout all of the wetland restoration areas. Pruned any dead material, basic maintenance.

May 24, 2001: Site inspection and maintenance. Planned on additional planting at OU-1 Fairway Pond. Planting was delayed due to flooded conditions throughout the site. Minimal maintenance was conducted due to flooded site conditions.

June 6, 2001: Planted four additional trees near Hathaway Road to replace plants cut for OU-1 well installation. These included 2 Green Ash (*Fraxinus pensylvanica*) and 2 Black Willow (*Salix nigra*) trees.

Installed aquatic plant material within OU-1 Fairway Pond:

- 100 *Nuphar luteum* (large root ends)
- 500 *Potamogeton nodosus* (weighted tubers)
- 250 *Iris versicolor* (2" Peat Pots)

June 14, 2001: General site inspection and maintenance. Pruned OU-2 Adjacent Wetland, and OU-1 Stream channels. Cut cattails from OU-2 Adjacent Wetland.

June 21, 2001: Planted the remaining emergent plant material around the OU-1 Fairway Pond. Installed duck fencing around susceptible species. The plants installed included:

- 100 *Peltandra virginica* (2" Peat Pots)
- 50 *Lobelia cardinalis* (2" Peat Pots)
- 50 *Caltha palustris* (2" Peat Pots)
- 200 *Carex stricta* (2" Peat Pots)
- 200 *Juncus effusus* (2" Peat Pots)
- 150 *Scirpus cyperinus* (2" Peat Pots)

June 27, 2001: General site inspection/maintenance. Repaired BioLogs within the OU-1 stream restoration channel, pruned plant material, manually removed cattails from the stream channel and banks. Re-seeded bare areas within OU-1 and OU-2.

July 2, 2001: General site inspection/maintenance for all OU-1 and OU-2 sites. Planted Haul Road with the following plant material:

- 10 *Acer rubrum* (6-8')
- 25 *Viburnum trilobum* (3-4')

July 12, 2001: General site inspection/maintenance for all OU-1 and OU-2 sites. Installed erosion control within Haul Road area. Planted the following plant material in the Haul Road area:

- 10 *Salix nigra* (3-4')

- 50 *Clethra alnifolia* (18-24")
- 25 *Viburnum dentatum* (18-24")
- 25 *Viburnum lentago* (18-24")
- 25 *Aronia arbutifolia* (18-24")

July 18, 2001: General site inspection/maintenance for all OU-1 and OU-2 sites. Manually cut and sprayed cut cattail stems within the OU-2 Middle Marsh with Rodeo.

July 24, 2001: General site inspection/maintenance for all OU-1 and OU-2 sites. Planted the Haul Road area with the following plant material:

- 20 *Pinus strobus* (6-8')

August 8, 2001: General site inspection/maintenance for all OU-1 and OU-2 sites. Cattail/Loosestrife spraying with Rodeo in OU-2 Middle Marsh.

August 15, 2001: General site inspection/maintenance for all OU-1 and OU-2 sites. Cattail, Phragmites, and Purple Loosestrife control (with Rodeo) around the OU-1 Fairway Pond, and along the entire banks of the un-named stream (OU-1 and OU-2 within the Middle Marsh). Pulled duck fencing from the OU-1 Fairway Pond, plants have established themselves, and are well rooted. Installed additional trees within the OU-1 Adjacent to Fairway Pond Mitigation area. The following plants were installed:

- 3 *Acer rubrum* (4-6')
- 3 *Fraxinus pensylvanica* (4-6')
- 5 *Salix nigra* (3-4')
- 150 *Peltandra virginica* (2" Peat Pots)
- 150 *Scirpus americanus* (2" Peat Pots)
- 50 *Sagittaria latifolia* (2" Peat Pots)

August 29, 2001: General site inspection/maintenance for all OU-1 and OU-2 sites. Cattail/Purple Loosestrife spraying with Rodeo in the OU-2 Middle Marsh. Covered approximately 2 + acres.

September 12, 2001: General site maintenance for all OU-1 and OU-2 sites. Cattail/Phragmites spraying with Rodeo within the OU-2 Middle Marsh.

September 26, 2001: General site inspection/maintenance for all OU-1 and OU-2 sites.

Cattail/Phragmites spraying with Rodeo within the OU-2 Middle Marsh. Completion of the OU-2 Middle Marsh spraying of invasive species with Rodeo.

October 18, 2001: General Fall site inspection/maintenance for all OU-1 and OU-2 sites. Set up vegetative monitoring plant plots within all wetland areas to be sampled in 2002.

October 23, 2001: Fall site inspection, and site security inspection by Travis Canon, Harding, ESE. Installed new piezometers.

October 26, 2001. Groundwater samples taken. Results from Groundwater Analytical are attached. Soil samples taken. Results from Groundwater Analytical are attached.

November 5, 2001: Plants are dormant, general site inspection for all OU-1 and OU-2 sites.

December 13, 2001: Plants are dormant. Cleaned up litter debris from OU-1 stream channel. General site inspection of all OU-1 and OU-2 wetlands.

Sullivan's Ledge
2002 Proposed Monitoring

The following tasks are proposed to take place in 2002 as part of the on-going wetland and site monitoring and maintenance plan:

- Monthly site inspections during the non-growing season (January, February*, March)
- Beginning in April, 2002, active plant maintenance, re-seeding disturbed area along the OU-1 stream within Middle Marsh, spraying emerging cattail plants and Phragmites with Rodeo.
- Approximately 110 linear feet of BioLog removed along the OU-1 stream channel (convergence of un-named stream and diversion channel) during site work will be replaced, and the banks re-planted.
- Ponded areas within the Middle Marsh and Adjacent Wetland will be searched for the Mystic Valley Amphipod.
- Re-planting wetland areas as necessary.
- Quantitative Biologic Monitoring within specified Plant plots will be conducted during the Spring and the late Summer.
- Surface water samples, sediment samples will be collected and analyzed.
- Hydric soil profiles within the created wetland areas will be conducted.
- Site security inspections will be conducted quarterly.
- Non-growing season inspections will take place in October, November and December.
- An annual report for 2002 will be prepared at the end of the calandar year.

NEW ENGLAND ENVIRONMENTAL, INC.

2001

INSPECTION REPORTS
AND
ANALYTICAL RESULTS

Sullivan's Ledge Wetland Monitoring Requirements
Based on OU-2 O & M Plan dated January 13, 99
Based on OU- 1 .....

Task Description	QTY	Analyses (see Table 2-1)	Criteria	Frequency	Responsible Party	Location	Duration
Operable Unit 2 Requirements:							
Annual Report	1		75 % Veg. Coverage	annually	NEE		
Surface Water Samples from Un-named Strm through Mid. Mars	4	pH, PCBs (filtered & unfiltered)	15 ppm	annually	Harding ESE	see Fig. 2-1	3 yrs., & in yr. 5
Sediment Samples	4	PCBs, TOC	15ppm, 20mg PCB/gC	annually	Harding ESE	see Fig. 2-1	3 yrs., & in yr. 5
Wetland Sediment/Soil Samples from Adjacent Wetlands	2	PCBs	15 ppm	annually	Harding ESE	*Section 4 Plots*	3 yrs., & in yr. 5
Wetland Sediment/Soil Samples from Middle Marsh	4	PCBs	15 ppm	annually	Harding ESE	*Section 4 Plots*	3 yrs., & in yr. 5
Hummocks: - 100 sq. ft. Plots in Middle Marsh	4	Visual	a. Integrity b. 25 % coverage	annually	NEE		3 yrs., & in 5 yrs.
Piezometers	6	water elevation	less than 12 inches from ground surface at least 3 of the 5 years	4/yr. (April-Oct.) (to be taken after 2 days w/o rain)	Harding ESE	2 outside limits of excav. 3 within Middle Marsh 1 within the Adj. Wet.	3 yrs., & in 5 yrs
Hydric Soils Profile	1	Borings	to meet "hydric" in 10 yrs.	annually (1)	NEE	Appendix C	3 yrs., & in 5 yrs. (1)
Biological Monitoring: Monitored Plots- - 100 sq. ft. Plots in Middle Marsh (same as used for Hummock evaluation)	4	Visual/ Photographs	a. 75% Veg. Cover following 2 full growing seasons b. Plant Survival Rates, 80 % at end 5 yrs. c. Tree Growth, increase 20% at end 5 yrs. d. Vegetative Diversity - at least 1 woody & 1 herbaceous non-invasive planted species added every 5 yrs. e. Plant Community- 50 % of dominant plants	annually, end of growing season late Aug.-early Sept.	NEE	Min. 1 in hummock area Min. 1 in pool or hollow	3 yrs., & in 5 yrs.
- 100 sq. ft. Plots in Adjacent Wetlands	2	" "	a. 75% Veg. Cover following 2 full growing seasons b. Plant Survival rates, 80 % at end 5 yrs. c. Vegetative Diversity - at least 1 woody & 1 herbaceous non-invasive planted species added every 5 yrs. d. Plant Community- 50 % of dominant plants	" "	NEE	One in scrub-shrub One in emergent	" "
Mystic Valley Amphipod (MVA): - Two sweeps 3 ft. long from two areas in the Adjacent Wetlands - Two sweeps 3 ft. long from five areas in the Middle Marsh	2 5		If the Mystic Valley Amphipod is confirmed during the pre-remediation activities, then must be confirmed by the end of the third year.	Spring (mid. April to mid may)	NEE NEE		
Documented Information: - Qualitative Assessment - Photographic documentation - Assessment of Invasive Species - Assessment of Erosion				Annually, during both Spring and Summer	NEE NEE Harding ESE/NEE		
Maintenance: - Invasive Species - Replacement of Plants - Topsoil Replacement				as required	NEE NEE Harding ESE		
Site Security Inspections: - Spring		General Site Conditions MVA Monitoring Site Security	Quarterly: April or early May	Quarterly: April or early May	Harding ESE NEE Harding ESE		
- Summer		General Site Conditions Site Security Analytical Samples	August	August	Harding ESE Harding ESE Harding ESE		
- Fall		General Site Conditions Site Security Institutional Controls	November	November	Harding ESE Harding ESE Harding ESE		
		General Site Conditions Site Security	February	February	Harding ESE Harding ESE		

Notes:
1) In excess of requirements (more frequently then specified)

SULLIVAN'S LEDGE SUPERFUND SITE

OPERABLE UNIT 2 SITE MAINTENANCE SCHEDULE

GENERAL/SITE SECURITY/WETLAND
FIELD 0&M TEAM LEADER: Scott Fisher
OTHER FIELD TEAM MEMBER(S): None
DATE & TIME OF MAINTENANCE ACTIVITY: 10/18/01 **FROM** 10 **A.M. TO** 3 **P.M.**

MAINTENANCE PERFORMED (check)	GENERAL MAINTENANCE ITEM	REMARKS
	Removal of litter or debris	
_____ _____ _____	Repair or erosion damage: • Filling • Grading • Other (describe)	
_____ _____ _____ _____ _____ _____	Care of upland vegetative cover: • Seeding • Fertilizing • Topsoil replacement • Removal of undesired vegetation • Grass cutting • Other (describe)	
	Removal of drainage obstruction	
_____ _____ _____ _____	Repair of roads and paths • Filing • Grading • Paving (asphalt or stone) • Other (describe)	
X	Other maintenance (describe)	Pruning of OU2 wetland areas. Establish OU2 vegetative monitoring plots.

MAINTENANCE PERFORMED (check)	SITE SECURITY MAINTENANCE ITEM	REMARKS
	Repair or replace fence fabric	
	Repair or replace fence posts	
	Repair or replace fence rails	
	Repair or replace gates	
	Repair or replace locks	
	Repair or replace warning signs	
	Other maintenance (describe)	

MAINTENANCE PERFORMED (check)	WETLAND MAINTENANCE ITEM	REMARKS
X	Evaluate conditions of tree species (height, DBH, canopy)	
X	Evaluate general growth and health of restored wetland plants - replace plants if required	No replacement needed at this time. Plants have entered dormancy.
X	Evaluate condition of hummocks	Hummocks are stable at this time.
X	Assess invasive species, corrective action if required	Invasive species on site, additional treatment needed in spring 2002
X	Evaluate erosion in restored wetlands, replace top soil, if required	No erosion recorded
X	Evaluate whether major impacts to restored wetlands, report to USEPA if required	No major impacts recorded.
X	Evaluate whether condition is too dry to support wetland plants. Irrigate if necessary	Very dry late summer and early fall. Plants did not show signs of impact.

Field Inspection Certified Complete By:

Field Team Leader

10/18/01
Date

SULLIVAN'S LEDGE SUPERFUND SITE

OPERABLE UNIT 2 SITE MAINTENANCE SCHEDULE

GENERAL/SITE SECURITY/WETLAND
FIELD O&M TEAM LEADER: Scott Fisher
OTHER FIELD TEAM MEMBER(S): None
DATE & TIME OF MAINTENANCE ACTIVITY: 11/05/01 **FROM** 10 **A.M. TO** 3 **P.M.**

MAINTENANCE PERFORMED (check)	GENERAL MAINTENANCE ITEM	REMARKS
	Removal of litter or debris	
_____ _____ _____	Repair or erosion damage: • Filling • Grading • Other (describe)	
_____ _____ _____ _____ _____ _____	Care of upland vegetative cover: • Seeding • Fertilizing • Topsoil replacement • Removal of undesired vegetation • Grass cutting • Other (describe)	
	Removal of drainage obstruction	
_____ _____ _____ _____	Repair of roads and paths • Filing • Grading • Paving (asphalt or stone) • Other (describe)	
X	Other maintenance (describe)	Pruning of OU2 wetland areas.

MAINTENANCE PERFORMED (check)	SITE SECURITY MAINTENANCE ITEM	REMARKS
	Repair or replace fence fabric	
	Repair or replace fence posts	
	Repair or replace fence rails	
	Repair or replace gates	
	Repair or replace locks	
	Repair or replace warning signs	
	Other maintenance (describe)	

MAINTENANCE PERFORMED (check)	WETLAND MAINTENANCE ITEM	REMARKS
X	Evaluate conditions of tree species (height, DBH, canopy)	
X	Evaluate general growth and health of restored wetland plants - replace plants if required	No replacement needed at this time. Plants have entered dormancy.
X	Evaluate condition of hummocks	Hummocks are stable at this time.
X	Assess invasive species, corrective action if required	Invasive species on site, additional treatment needed in spring 2002
X	Evaluate erosion in restored wetlands, replace top soil, if required	No erosion recorded
X	Evaluate whether major impacts to restored wetlands, report to USEPA if required	No major impacts recorded.
X	Evaluate whether condition is too dry to support wetland plants. Irrigate if necessary	Very dry late summer and early fall. Plants did not show signs of impact.

Field Inspection Certified Complete By:

Scott Kirn

Field Team Leader

11/05/01

Date

SULLIVAN'S LEDGE SUPERFUND SITE

OPERABLE UNIT 2 SITE MAINTENANCE SCHEDULE

GENERAL/SITE SECURITY/WETLAND
FIELD 0&M TEAM LEADER: Michael Marcus
OTHER FIELD TEAM MEMBER(S): None
DATE & TIME OF MAINTENANCE ACTIVITY: 12/13/01 **FROM** 10 **A.M. TO** 3 **P.M.**

MAINTENANCE PERFORMED (check)	GENERAL MAINTENANCE ITEM	REMARKS
	Removal of litter or debris	
_____ _____ _____	Repair or erosion damage: • Filling • Grading • Other (describe)	
_____ _____ _____ _____ _____ _____	Care of upland vegetative cover: • Seeding • Fertilizing • Topsoil replacement • Removal of undesired vegetation • Grass cutting • Other (describe)	
	Removal of drainage obstruction	
_____ _____ _____ _____	Repair of roads and paths • Filing • Grading • Paving (asphalt or stone) • Other (describe)	
	Other maintenance (describe)	

MAINTENANCE PERFORMED (check)	SITE SECURITY MAINTENANCE ITEM	REMARKS
	Repair or replace fence fabric	
	Repair or replace fence posts	
	Repair or replace fence rails	
	Repair or replace gates	
	Repair or replace locks	
	Repair or replace warning signs	
	Other maintenance (describe)	

MAINTENANCE PERFORMED (check)	WETLAND MAINTENANCE ITEM	REMARKS
X	Evaluate conditions of tree species (height, DBH, canopy)	
X	Evaluate general growth and health of restored wetland plants - replace plants if required	No replacement needed at this time. Plants are dormant.
X	Evaluate condition of hummocks	Hummocks are stable at this time.
X	Assess invasive species, corrective action if required	Invasive species on site, additional treatment needed in spring 2002
X	Evaluate erosion in restored wetlands, replace top soil, if required	No erosion recorded
X	Evaluate whether major impacts to restored wetlands, report to USEPA if required	No major impacts recorded.
X	Evaluate whether condition is too dry to support wetland plants. Irrigate if necessary	

Field Inspection Certified Complete By:

Field Team Leader Michael J. Marcus

Dec. 13, 2001
Date

SULLIVAN'S LEDGE SUPERFUND SITE

OPERABLE UNIT 2 SITE INSPECTION CHECKLIST

FALL INSPECTION
GENERAL/SITE SECURITY/INSTITUTIONAL CONTROL
FIELD O&M TEAM LEADER: Travis Cannon
OTHER FIELD TEAM MEMBER(S): Andrew Sutton, Jesse Naiden
DATE & TIME OF INSPECTION: 10/23/01 **FROM** 9 **A.M. TO** 3 **P.M.**

GENERAL INSPECTION	CONDITION (Check) Acceptable	Not Acceptable	REMARKS
Accumulation of litter or debris	✓		NONE other than erosion around South East Silt fence
Evidence of erosion damage	✓		Wash out and slumping to 55' SE of mw-2 and 75' SW of mw-2
Health of upland vegetative cover	✓		Thin spot directly SE of main treatment house.
Drainage obstruction	✓		Cleaned some debris from main
Condition of roads and paths	✓		Gap along western fence o.k.
Other observations	✓		Two low spots on headwall area

SITE SECURITY	CONDITION (Check) Acceptable	Not Acceptable	REMARKS
Fence fabric integrity	✓		present and competent.
Fence posts straight	✓		—
Fence rails	✓		—
Condition of gates	✓		—
Locks secure and functioning			Eastern Gate location to Seavel Hwy unlocked. (contd.)
Warning signs every 100' and secure	✓		Present alog site.

INSTITUTIONAL CONTROLS COMPLIANCE	CONDITION Present	(Check) Not Present	REMARKS
Site development or use other than for golf		✓	NONE
New groundwater wells		✓	Piezometers installed across Street, No new wells on-site
Evidence of intrusive earthwork.		✓	—
Evidence of soils being removed from area		✓	—
Evidence of tampering with existing site feature (sells, survey markers, etc.)		✓	—
Any other observations	✓		Slumping 3' diameter area at old abandoned MW-4

Field Inspection Certified Complete By:

for Travis Cannon

Field Team Leader

10/23/01

Date

GROUNDWATER ANALYTICAL

Groundwater Analytical, Inc.
P.O. Box 1200
228 Main Street
Buzzards Bay, MA 02532

Telephone (508) 759-4441
FAX (508) 759-4475

November 9, 2001

Mr. Travis Canon
Harding Lawson Associates
Construction Division
7000 E. Belleview Ave., Suite 209
Greenwood Village, Colorado 80111

Project: **Sullivan's Ledge/C47968.06**
Lab ID: **45616**
Sampled: **10-26-01**

Dear Travis:

Enclosed are the PCBs, pH and TCO Analyses performed for the above referenced project. This project was processed for Standard Two Week turnaround.

This letter authorizes the release of the analytical results, and should be considered a part of this report. This report contains a project narrative indicating project changes and non-conformances, a brief description of the Quality Assurance/Quality Control procedures employed by our laboratory, and a statement of our state certifications.

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Should you have any questions concerning this report, please do not hesitate to contact me.

Sincerely,

Jonathan R. Sanford
President

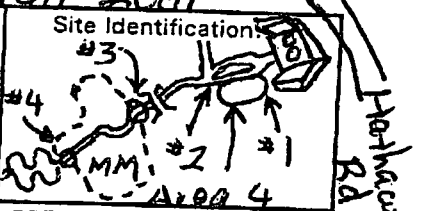
JRS/amb
Enclosures

OU-2: Surface Water, Post-Construction (45216)

Harding Lawson Associates
Construction Division
7000 E. Belleview Ave. Suite 209
Greenwood Village, Colorado 80111
Phone (303) 221-1360
Fax (303) 221-1361

Page 1 of 1
Lab I.D.: Groundwater Analytical
Work Authorization Number: C
Sample Round/Episode: 1st Quarter, Year 1 Fall 2001

CHAIN-OF-CUSTODY RECORD

Project Name/Project No.	Sample Date	Sample Technique:	Site Identification:
Final O+M Plan Post-Construction	10/26/01	Grab	
Sampler: (Signature)	**Sample Depth: (Ft.)**	**File-Type/Matrix:**	
R. Travis Canon	NA	Water	

TIME	SAMPLE I.D.	ANALYSIS REQUIRED	CONTAINER	PRESERVATIVE/REMARKS
14:40	SWPC-10	2601-1		2-week turn
14:45	SWPC-10	2601-2		
15:30	SWPC-10	2601-3		• Sullivan's
16:46	SWPC-10	2601-4		Ledge
		• PCBs →	1 l amber bottles (2 bottles)	
		• pH →	250 ml plastic (1 bottle	
• Note to HLA: Samples collected w/ decon'ned SS bowl + spoons; decon'ned per OU-1 decon procedures: Alkonox wash, triple distilled water rinse, alcohol rinse, and final DI water rinse.				
• Surface Water samples collected at same location as Sed. samples.				

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
R. Travis Canon	Fri 10/26/01	Emily B. Thuma
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)

Airbill Number: Groundwater Analytical ~~RTC~~ RTC deliver

Final File Copy/White Lab File Copy/Yellow Field Copy/Pink 00101 CD

• SWPC-10 2601-1, 2, 3, 4

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**SWPC-102601-1**	Laboratory ID:	**45616-11**
Project:	**Sullivan's Ledge/C47968.06**	QC Batch ID:	**PB-0868-F**
Client:	**Harding Lawson Associates**	Sampled:	**10-26-01**
Container:	**1 L Amber Glass**	Received:	**10-26-01**
Preservation:	**Cool**	Extracted:	**11-02-01**
Matrix:	**Aqueous**	Analyzed:	**11-07-01**
		Dilution Factor:	**1**

CAS Number	Analyte	Concentration	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL	ug/L	0.2
11104-28-2	Aroclor 1221	BRL	ug/L	0.2
11141-16-5	Aroclor 1232	BRL	ug/L	0.2
53469-21-9	Aroclor 1242	BRL	ug/L	0.2
12672-29-6	Aroclor 1248	BRL	ug/L	0.2
11097-69-1	Aroclor 1254	BRL	ug/L	0.2
11096-82-5	Aroclor 1260	BRL	ug/L	0.2

QC Surrogate Compound	Recovery	QC Limits
Tetrachloro-*m*-xylene	73 %	57 - 118 %
Decachlorobiphenyl	94 %	64 - 134 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as Aroclor analytes formerly specified by EPA Method 8080A.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample-dilution and sample size.

GROUNDWATER ANALYTICAL

Inorganic Chemistry

Field ID: **SW PC-102601-1**
Project: **Sullivan's Ledge/C47968.06**
Client: **Harding Lawson Associates**

Matrix: **Aqueous**
Sampled: **10-26-01**
Received: **10-26-01**

Lab ID: **45616-15** Container: **250 mL Plastic** Preservation: **Cool**

Analyte	Result	Units	Reporting Limit	Analyzed	QC Batch	Method
pH	6.4	pH	N/A	10-26-01	PH-1122-W	EPA 150.1

Method References: Methods for Chemical Analysis of Water and Wastes, US EPA, EPA-600/4-790-020, Revised (1983), and Methods for the Determination of Inorganic Substances in Environmental Samples, US EPA, EPA/600/R-93/100, (1993), and Standard Methods for the Examination of Water and Wastewater, APHA, Eighteenth Edition (1992).

Report Notations: BRL Indicates result, if any, is below reporting limit for analyte. Reporting limit is the lowest value that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution and sample size.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	SWPC-102601-2	Laboratory ID:	45616-12
Project:	Sullivan's Ledge/C47968.06	QC Batch ID:	PB-0867-F
Client:	Harding Lawson Associates	Sampled:	10-26-01
Container:	1 L Amber Glass	Received:	10-26-01
Preservation:	Cool	Extracted:	10-31-01
Matrix:	Aqueous	Analyzed:	11-07-01
		Dilution Factor:	1

CAS Number	Analyte	Concentration	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL	ug/L	0.2
11104-28-2	Aroclor 1221	BRL	ug/L	0.2
11141-16-5	Aroclor 1232	BRL	ug/L	0.2
53469-21-9	Aroclor 1242	BRL	ug/L	0.2
12672-29-6	Aroclor 1248	BRL	ug/L	0.2
11097-69-1	Aroclor 1254	BRL	ug/L	0.2
11096-82-5	Aroclor 1260	BRL	ug/L	0.2

QC Surrogate Compound	Recovery	QC Limits
Tetrachloro-*m*-xylene	75 %	57 - 118 %
Decachlorobiphenyl	100 %	64 - 134 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as Aroclor analytes formerly specified by EPA Method 8080A.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution and sample size.

GROUNDWATER ANALYTICAL

Inorganic Chemistry

Field ID: SW PC-102601-2
Project: Sullivan's Ledge/C47968.06
Client: Harding Lawson Associates

Matrix: Aqueous
Sampled: 10-26-01
Received: 10-26-01

Lab ID: 45616-16 Container: 250 mL Plastic Preservation: Cool

Analyte	Result	Units	Reporting Limit	Analyzed	QC Batch	Method
pH	6.6	pH	N/A	10-26-01	PH-1122-W	EPA 150.1

Method References: Methods for Chemical Analysis of Water and Wastes, US EPA, EPA-600/4-790-020, Revised (1983), and Methods for the Determination of Inorganic Substances in Environmental Samples, US EPA, EPA/600/R-93/100, (1993), and Standard Methods for the Examination of Water and Wastewater, APHA, Eighteenth Edition (1992).

Report Notations: BRL Indicates result, if any, is below reporting limit for analyte. Reporting limit is the lowest value that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution and sample size.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	SWPC-102601-3	Laboratory ID:	45616-13
Project:	Sullivan's Ledge/C47968.06	QC Batch ID:	PB-0867-F
Client:	Harding Lawson Associates	Sampled:	10-26-01
Container:	1 L Amber Glass	Received:	10-26-01
Preservation:	Cool	Extracted:	10-31-01
Matrix:	Aqueous	Analyzed:	11-07-01
		Dilution Factor:	1

CAS Number	Analyte	Concentration	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL	ug/L	0.2
11104-28-2	Aroclor 1221	BRL	ug/L	0.2
11141-16-5	Aroclor 1232	BRL	ug/L	0.2
53469-21-9	Aroclor 1242	BRL	ug/L	0.2
12672-29-6	Aroclor 1248	BRL	ug/L	0.2
11097-69-1	Aroclor 1254	BRL	ug/L	0.2
11096-82-5	Aroclor 1260	BRL	ug/L	0.2

QC Surrogate Compound	Recovery	QC Limits
Tetrachloro-*m*-xylene	70 %	57 - 118 %
Decachlorobiphenyl	94 %	64 - 134 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as Aroclor analytes formerly specified by EPA Method 8080A.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution and sample size.

GROUNDWATER ANALYTICAL

Inorganic Chemistry

Field ID: **SW PC-102601-3**
Project: **Sullivan's Ledge/C47968.06**
Client: **Harding Lawson Associates**

Matrix: **Aqueous**
Sampled: **10-26-01**
Received: **10-26-01**

Lab ID: **45616-17** Container: **250 mL Plastic** Preservation: **Cool**

Analyte	Result	Units	Reporting Limit	Analyzed	QC Batch	Method
pH	6.7	pH	N/A	10-26-01	PH-1122-W	EPA 150.1

Method References: Methods for Chemical Analysis of Water and Wastes, US EPA, EPA-600/4-790-020, Revised (1983), and Methods for the Determination of Inorganic Substances in Environmental Samples, US EPA, EPA/600/R-93/100, (1993), and Standard Methods for the Examination of Water and Wastewater, APHA, Eighteenth Edition (1992).

Report Notations: BRL Indicates result, if any, is below reporting limit for analyte. Reporting limit is the lowest value that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution and sample size.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	SWPC-102601-4	Laboratory ID:	45616-14
Project:	Sullivan's Ledge/C47968.06	QC Batch ID:	PB-0867-F
Client:	Harding Lawson Associates	Sampled:	10-26-01
Container:	1 L Amber Glass	Received:	10-26-01
Preservation:	Cool	Extracted:	10-31-01
Matrix:	Aqueous	Analyzed:	11-07-01
		Dilution Factor:	1

CAS Number	Analyte	Concentration	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL	ug/L	0.2
11104-28-2	Aroclor 1221	BRL	ug/L	0.2
11141-16-5	Aroclor 1232	BRL	ug/L	0.2
53469-21-9	Aroclor 1242	BRL	ug/L	0.2
12672-29-6	Aroclor 1248	BRL	ug/L	0.2
11097-69-1	Aroclor 1254	BRL	ug/L	0.2
11096-82-5	Aroclor 1260	BRL	ug/L	0.2

QC Surrogate Compound	Recovery	QC Limits
Tetrachloro-*m*-xylene	75 %	57 - 118 %
Decachlorobiphenyl	97 %	64 - 134 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as Aroclor analytes formerly specified by EPA Method 8080A.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution and sample size.

GROUNDWATER ANALYTICAL

Inorganic Chemistry

Field ID: **SW PC-102601-4**
Project: **Sullivan's Ledge/C47968.06**
Client: **Harding Lawson Associates**

Matrix: **Aqueous**
Sampled: **10-26-01**
Received: **10-26-01**

Lab ID: **45616-18** Container: **250 mL Plastic** Preservation: **Cool**

Analyte	Result	Units	Reporting Limit	Analyzed	QC Batch	Method
pH	6.8	pH	N/A	10-26-01	PH-1122-W	EPA 150.1

Method References: Methods for Chemical Analysis of Water and Wastes, US EPA, EPA-600/4-790-020, Revised (1983), and Methods for the Determination of Inorganic Substances in Environmental Samples, US EPA, EPA/600/R-93/100, (1993), and Standard Methods for the Examination of Water and Wastewater, APHA, Eighteenth Edition (1992).

Report Notations: BRL Indicates result, if any, is below reporting limit for analyte. Reporting limit is the lowest value that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution and sample size.

OU-2: Soil (Plots), Post-Construction (45616)

Harding Lawson Associates
Construction Division
7000 E. Belleview Ave. Suite 209
Greenwood Village, Colorado 80111
Phone (303) 221-1360
Fax (303) 221-1361

Page 1 of 1
Lab I.D.: Groundwater Analytical
Work Authorization Number: C47968.06
Sample Round/Episode: 1st Quarter, Year 1 Fall 2001

CHAIN-OF-CUSTODY RECORD: Sullivan's Ledge

Project Name/Project No.	Sample Date	Sample Technique:	Site Identification:
Final O+M Plan Post-Construction	Fri 10/26/01	Grab	Adjacent wetlands and Middle Marsh
Sampler: ~~(Signature)~~ R. Travis Canon	Sample Depth: 0-6"	File-Type/Matrix: Soil	

TIME	SAMPLE I.D.	ANALYSIS REQUIRED	CONTAINER	PRESERVATIVE/REMARKS
15:55	Soil PC-	10260 1- ~~Plot 1~~ RTC	MM Plot 1	2-week turn
16:07	Soil PC-	10260 1- ~~Plot 2~~	MM Plot 2	
16:20	Soil PC-	10260 1- ~~Plot 3~~	MM Plot 3	
16:31	Soil PC-	10260 1- ~~Plot 4~~ RTC	MM Plot 4	
		• PCBs →	8 oz (250 ml) wide-mouth jar	
15:10	Soil PC-	10260 1- ~~Plot 1~~ RTC	AW Plot 1	← South Sample
15:15	Soil PC-	10260 1- ~~Plot 2~~ RTC	AW Plot 2	← North Sample
• Note to HLA: Samples collected w/ decanned SS bowls + spoons; decanned per OU-1 decon procedures: Alkonox wash, triple distilled-water rinse, alcohol rinse, + final DI water rinse. • Samples collected within low area of Plot.				

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
R. Travis Canon	Fri 10/26/01	Emily B. Grove
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)

Airbill Number: Groundwater Analytical ~~pickup~~: RTC delivered

Final File Copy/White — Lab File Copy/Yellow — Field Copy/Pink

MM = Middle Marsh AW = Adjacent Wetlands (Area 4)

00193 CD

• Soil PC-10260 1- Plot 1, 2, 3, 4 (MM) and AW-1, 2 (6 total)

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**Soil PC-102601-MM Plot 1**	Laboratory ID:	**45616-01**
Project:	**Sullivan's Ledge/C47968.06**	QC Batch ID:	**PB-1452-N**
Client:	**Harding Lawson Associates**	Sampled:	**10-26-01**
Container:	**250 mL Glass**	Received:	**10-26-01**
Preservation:	**Cool**	Extracted:	**11-07-01**
Matrix:	**Soil**	Analyzed:	**11-08-01**
% Moisture:	**25**	Dilution Factor:	**1**

CAS Number	Analyte	Concentration	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL	ug/Kg	80
11104-28-2	Aroclor 1221	BRL	ug/Kg	80
11141-16-5	Aroclor 1232	BRL	ug/Kg	80
53469-21-9	Aroclor 1242	BRL	ug/Kg	80
12672-29-6	Aroclor 1248	BRL	ug/Kg	80
11097-69-1	Aroclor 1254	360	ug/Kg	80
11096-82-5	Aroclor 1260	BRL	ug/Kg	80

QC Surrogate Compound	Recovery	QC Limits
Tetrachloro-*m*-xylene	76 %	25 - 121 %
Decachlorobiphenyl	86 %	28 - 138 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as Aroclor analytes formerly specified by EPA Method 8080A. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	Soil PC-102601-MM Plot 2	Laboratory ID:	45616-02
Project:	Sullivan's Ledge/C47968.06	QC Batch ID:	PB-1452-N
Client:	Harding Lawson Associates	Sampled:	10-26-01
Container:	250 mL Glass	Received:	10-26-01
Preservation:	Cool	Extracted:	11-07-01
Matrix:	Soil	Analyzed:	11-08-01
% Moisture:	27	Dilution Factor:	1

CAS Number	Analyte	Concentration	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL	ug/Kg	80
11104-28-2	Aroclor 1221	BRL	ug/Kg	80
11141-16-5	Aroclor 1232	BRL	ug/Kg	80
53469-21-9	Aroclor 1242	BRL	ug/Kg	80
12672-29-6	Aroclor 1248	BRL	ug/Kg	80
11097-69-1	Aroclor 1254	130	ug/Kg	80
11096-82-5	Aroclor 1260	BRL	ug/Kg	80

QC Surrogate Compound	Recovery	QC Limits
Tetrachloro-*m*-xylene	75 %	25 - 121 %
Decachlorobiphenyl	92 %	28 - 138 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as Aroclor analytes formerly specified by EPA Method 8080A. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	Soil PC-102601-MM Plot 3	Laboratory ID:	45616-03
Project:	Sullivan's Ledge/C47968.06	QC Batch ID:	PB-1452-N
Client:	Harding Lawson Associates	Sampled:	10-26-01
Container:	250 mL Glass	Received:	10-26-01
Preservation:	Cool	Extracted:	11-07-01
Matrix:	Soil	Analyzed:	11-08-01
% Moisture:	28	Dilution Factor:	1

CAS Number	Analyte	Concentration	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL	ug/Kg	80
11104-28-2	Aroclor 1221	BRL	ug/Kg	80
11141-16-5	Aroclor 1232	BRL	ug/Kg	80
53469-21-9	Aroclor 1242	BRL	ug/Kg	80
12672-29-6	Aroclor 1248	BRL	ug/Kg	80
11097-69-1	Aroclor 1254	BRL	ug/Kg	80
11096-82-5	Aroclor 1260	BRL	ug/Kg	80

QC Surrogate Compound	Recovery	QC Limits
Tetrachloro-*m*-xylene	35 %	25 - 121 %
Decachlorobiphenyl	59 %	28 - 138 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as Aroclor analytes formerly specified by EPA Method 8080A. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	Soil PC-102601-MM Plot 4	Laboratory ID:	45616-04
Project:	Sullivan's Ledge/C47968.06	QC Batch ID:	PB-1452-N
Client:	Harding Lawson Associates	Sampled:	10-26-01
Container:	250 mL Glass	Received:	10-26-01
Preservation:	Cool	Extracted:	11-07-01
Matrix:	Soil	Analyzed:	11-08-01
% Moisture:	20	Dilution Factor:	1

CAS Number	Analyte	Concentration	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL	ug/Kg	80
11104-28-2	Aroclor 1221	BRL	ug/Kg	80
11141-16-5	Aroclor 1232	BRL	ug/Kg	80
53469-21-9	Aroclor 1242	BRL	ug/Kg	80
12672-29-6	Aroclor 1248	BRL	ug/Kg	80
11097-69-1	Aroclor 1254	BRL	ug/Kg	80
11096-82-5	Aroclor 1260	BRL	ug/Kg	80

QC Surrogate Compound	Recovery	QC Limits
Tetrachloro-*m*-xylene	68 %	25 - 121 %
Decachlorobiphenyl	78 %	28 - 138 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as Aroclor analytes formerly specified by EPA Method 8080A. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	Soil PC-102601-AW Plot 1	Laboratory ID:	45616-05
Project:	Sullivan's Ledge/C47968.06	QC Batch ID:	PB-1452-N
Client:	Harding Lawson Associates	Sampled:	10-26-01
Container:	250 mL Glass	Received:	10-26-01
Preservation:	Cool	Extracted:	11-07-01
Matrix:	Soil	Analyzed:	11-08-01
% Moisture:	21	Dilution Factor:	1

CAS Number	Analyte	Concentration	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL	ug/Kg	80
11104-28-2	Aroclor 1221	BRL	ug/Kg	80
11141-16-5	Aroclor 1232	BRL	ug/Kg	80
53469-21-9	Aroclor 1242	BRL	ug/Kg	80
12672-29-6	Aroclor 1248	BRL	ug/Kg	80
11097-69-1	Aroclor 1254	BRL	ug/Kg	80
11096-82-5	Aroclor 1260	BRL	ug/Kg	80

QC Surrogate Compound	Recovery	QC Limits
Tetrachloro-*m*-xylene	66 %	25 - 121 %
Decachlorobiphenyl	86 %	28 - 138 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as Aroclor analytes formerly specified by EPA Method 8080A. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**Soil PC-102601-AW Plot 2**	Laboratory ID:	**45616-06**
Project:	**Sullivan's Ledge/C47968.06**	QC Batch ID:	**PB-1452-N**
Client:	**Harding Lawson Associates**	Sampled:	**10-26-01**
Container:	**250 mL Glass**	Received:	**10-26-01**
Preservation:	**Cool**	Extracted:	**11-07-01**
Matrix:	**Soil**	Analyzed:	**11-08-01**
% Moisture:	**15**	Dilution Factor:	**1**

CAS Number	Analyte	Concentration	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL	ug/Kg	80
11104-28-2	Aroclor 1221	BRL	ug/Kg	80
11141-16-5	Aroclor 1232	BRL	ug/Kg	80
53469-21-9	Aroclor 1242	BRL	ug/Kg	80
12672-29-6	Aroclor 1248	BRL	ug/Kg	80
11097-69-1	Aroclor 1254	140	ug/Kg	80
11096-82-5	Aroclor 1260	BRL	ug/Kg	80

QC Surrogate Compound	Recovery	QC Limits
Tetrachloro-*m*-xylene	67 %	25 - 121 %
Decachlorobiphenyl	91 %	28 - 138 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as Aroclor analytes formerly specified by EPA Method 8080A. Results are reported on a dry weight basis.

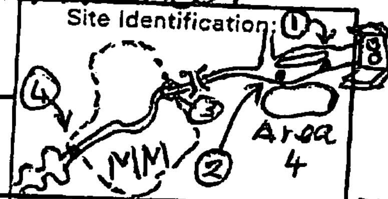
Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

OU-2: Sediments, Post-Construction (45611)

Harding Lawson Associates
Construction Division
7000 E. Belleview Ave. Suite 209
Greenwood Village, Colorado 80111
Phone (303) 221-1360
Fax (303) 221-1361

Page 1 of 1
Lab I.D.: Groundwater Analytical
Work Authorization Number: C
Sample Round/Episode: Year 1, 1st Quarter Fall 2001

CHAIN-OF-CUSTODY RECORD

Project Name/Project No.	Sample Date	Sample Technique:	Site Identification:
O+M Plan Post-Construction	10/26/01	Grab	
Sampler: (Signature)	**Sample Depth:**	**File-Type/Matrix:**	
R. Travis Canon	0-6 inches	Sediment	

TIME	SAMPLE I.D.	ANALYSIS REQUIRED	CONTAINER	PRESERVATIVE/REMARKS
14:40	SedPC-102601-1		8-oz wide-mouth jar	
14:45	Sed PC-102601-2		" " "	"
15:30	Sed PC-102601-3		" " "	"
16:46	Sed PC-102601-4		" " "	"

- PCBs
- ~~TOC (Total Organic Car~~ RTC
- TCO (Total Combustible Organics)

- Sullivan's Ledge

- Note to HLA: Samples collected w/ SS bowls + spoons per OU-1 decon procedures: Alkonox wash, triple distilled water rinse, ~~and a final DI water rinse~~ alcohol rinse, and a ~~distilled~~ DI water rinse.
- Sed samples collected at same location as Surface Water samples.

(4 total)

- SedPC-102601-1, 2, 3, and 4

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
R. Travis Canon	Fri 10/26/01	[signature]
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)

Airbill Number: Groundwater Analytical ~~Pickup~~: RTC deliver. RTC.

al File Copy/White   Lab File Copy/Yellow   Field Copy/Pink

00194 CD

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**Sed PC-102601-1**	Laboratory ID:	**45616-07**
Project:	**Sullivan's Ledge/C47968.06**	QC Batch ID:	**PB-1452-N**
Client:	**Harding Lawson Associates**	Sampled:	**10-26-01**
Container:	**250 mL Glass**	Received:	**10-26-01**
Preservation:	**Cool**	Extracted:	**11-07-01**
Matrix:	**Soil**	Analyzed:	**11-08-01**
% Moisture:	**17**	Dilution Factor:	**1**

CAS Number	Analyte	Concentration	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL	ug/Kg	80
11104-28-2	Aroclor 1221	BRL	ug/Kg	80
11141-16-5	Aroclor 1232	BRL	ug/Kg	80
53469-21-9	Aroclor 1242	BRL	ug/Kg	80
12672-29-6	Aroclor 1248	BRL	ug/Kg	80
11097-69-1	Aroclor 1254	120	ug/Kg	80
11096-82-5	Aroclor 1260	BRL	ug/Kg	80

QC Surrogate Compound	Recovery	QC Limits
Tetrachloro-*m*-xylene	76 %	25 - 121 %
Decachlorobiphenyl	86 %	28 - 138 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as Aroclor analytes formerly specified by EPA Method 8080A. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

$(120\ \mu g/Kg\ PCB \div 1000) \div 0.007 = \frac{17\ mg\ PCB}{g\ C} < 20$

GROUNDWATER ANALYTICAL

Inorganic Chemistry

Field ID: **Sed PC-102601-1**
Project: **Sullivan's Ledge/C47968.06**
Client: **Harding Lawson Associates**

Matrix: **Soil**
Sampled: **10-26-01**
Received: **10-26-01**

Lab ID: **45616-07** Container: **250 mL Glass** Preservation: **Cool**

Analyte	Result	Units	Reporting Limit	Analyzed	QC Batch	Method
Combustible Organics, Total	0.7	%	0.1	10-29-01	TCO-0133-S	ASTM D2974-87

Method References: Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils, American Society for Testing and Materials, (1987).

Report Notations: BRL Indicates result, if any, is below reporting limit for analyte. Reporting limit is the lowest value that can be reliably quantified under routine laboratory operating conditions.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**Sed PC-102601-2**	Laboratory ID:	**45616-08**
Project:	**Sullivan's Ledge/C47968.06**	QC Batch ID:	**PB-1452-N**
Client:	**Harding Lawson Associates**	Sampled:	**10-26-01**
Container:	**250 mL Glass**	Received:	**10-26-01**
Preservation:	**Cool**	Extracted:	**11-07-01**
Matrix:	**Soil**	Analyzed:	**11-08-01**
% Moisture:	**26**	Dilution Factor:	**1**

CAS Number	Analyte	Concentration	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL	ug/Kg	80
11104-28-2	Aroclor 1221	BRL	ug/Kg	80
11141-16-5	Aroclor 1232	BRL	ug/Kg	80
53469-21-9	Aroclor 1242	BRL	ug/Kg	80
12672-29-6	Aroclor 1248	BRL	ug/Kg	80
11097-69-1	Aroclor 1254	BRL	ug/Kg	80
11096-82-5	Aroclor 1260	BRL	ug/Kg	80

QC Surrogate Compound	Recovery	QC Limits
Tetrachloro-m-xylene	73 %	25 - 121 %
Decachlorobiphenyl	86 %	28 - 138 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as Aroclor analytes formerly specified by EPA Method 8080A. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

GROUNDWATER ANALYTICAL

Inorganic Chemistry

Field ID: **Sed PC-102601-2**
Project: **Sullivan's Ledge/C47968.06**
Client: **Harding Lawson Associates**

Matrix: **Soil**
Sampled: **10-26-01**
Received: **10-26-01**

Lab ID: **45616-08** Container: **250 mL Glass** Preservation: **Cool**

Analyte	Result	Units	Reporting Limit	Analyzed	QC Batch	Method
Combustible Organics, Total	1.5	%	0.1	10-29-01	TCO-0133-S	ASTM D2974-87

Method References: Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils, American Society for Testing and Materials, (1987).

Report Notations: BRL Indicates result, if any, is below reporting limit for analyte. Reporting limit is the lowest value that can be reliably quantified under routine laboratory operating conditions.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**Sed PC-102601-3**	Laboratory ID:	**45616-09**
Project:	**Sullivan's Ledge/C47968.06**	QC Batch ID:	**PB-1452-N**
Client:	**Harding Lawson Associates**	Sampled:	**10-26-01**
Container:	**250 mL Glass**	Received:	**10-26-01**
Preservation:	**Cool**	Extracted:	**11-07-01**
Matrix:	**Soil**	Analyzed:	**11-08-01**
% Moisture:	**13**	Dilution Factor:	**1**

CAS Number	Analyte	Concentration	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL	ug/Kg	80
11104-28-2	Aroclor 1221	BRL	ug/Kg	80
11141-16-5	Aroclor 1232	BRL	ug/Kg	80
53469-21-9	Aroclor 1242	BRL	ug/Kg	80
12672-29-6	Aroclor 1248	BRL	ug/Kg	80
11097-69-1	Aroclor 1254	BRL	ug/Kg	80
11096-82-5	Aroclor 1260	BRL	ug/Kg	80

QC Surrogate Compound	Recovery	QC Limits
Tetrachloro-*m*-xylene	77 %	25 - 121 %
Decachlorobiphenyl	86 %	28 - 138 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as Aroclor analytes formerly specified by EPA Method 8080A. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

GROUNDWATER ANALYTICAL

Inorganic Chemistry

Field ID: **Sed PC-102601-3**
Project: **Sullivan's Ledge/C47968.06**
Client: **Harding Lawson Associates**

Matrix: **Soil**
Sampled: **10-26-01**
Received: **10-26-01**

Lab ID: **45616-09** Container: **250 mL Glass** Preservation: **Cool**

Analyte	Result	Units	Reporting Limit	Analyzed	QC Batch	Method
Combustible Organics, Total	1.2	%	0.1	10-29-01	TCO-0133-S	ASTM D2974-87

Method References: Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils, American Society for Testing and Materials, (1987).

Report Notations: BRL Indicates result, if any, is below reporting limit for analyte. Reporting limit is the lowest value that can be reliably quantified under routine laboratory operating conditions.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**Sed PC-102601-4**	Laboratory ID:	**45616-10**
Project:	**Sullivan's Ledge/C47968.06**	QC Batch ID:	**PB-1452-N**
Client:	**Harding Lawson Associates**	Sampled:	**10-26-01**
Container:	**250 mL Glass**	Received:	**10-26-01**
Preservation:	**Cool**	Extracted:	**11-07-01**
Matrix:	**Soil**	Analyzed:	**11-08-01**
% Moisture:	**17**	Dilution Factor:	**1**

CAS Number	Analyte	Concentration	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL	ug/Kg	80
11104-28-2	Aroclor 1221	BRL	ug/Kg	80
11141-16-5	Aroclor 1232	BRL	ug/Kg	80
53469-21-9	Aroclor 1242	BRL	ug/Kg	80
12672-29-6	Aroclor 1248	BRL	ug/Kg	80
11097-69-1	Aroclor 1254	BRL	ug/Kg	80
11096-82-5	Aroclor 1260	BRL	ug/Kg	80

QC Surrogate Compound	Recovery	QC Limits
Tetrachloro-*m*-xylene	81 %	25 - 121 %
Decachlorobiphenyl	75 %	28 - 138 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Analyte list as Aroclor analytes formerly specified by EPA Method 8080A. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample dilution, percent moisture and sample size.

GROUNDWATER ANALYTICAL

Inorganic Chemistry

Field ID: **Sed PC-102601-4**
Project: **Sullivan's Ledge/C47968.06**
Client: **Harding Lawson Associates**

Matrix: **Soil**
Sampled: **10-26-01**
Received: **10-26-01**

Lab ID: **45616-10** Container: **250 mL Glass** Preservation: **Cool**

Analyte	Result	Units	Reporting Limit	Analyzed	QC Batch	Method
Combustible Organics, Total	0.7	%	0.1	10-29-01	TCO-0133-S	ASTM D2974-87

Method References: Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils, American Society for Testing and Materials, (1987).

Report Notations: BRL Indicates result, if any, is below reporting limit for analyte. Reporting limit is the lowest value that can be reliably quantified under routine laboratory operating conditions.

GROUNDWATER ANALYTICAL

Project Narrative

Project: **Sullivan's Ledge/C47968.06**
Client: **Harding Lawson Associates**

Lab ID: **45616**
Received: **10-26-01**

A. Physical Condition of Sample(s)

This project was received by the laboratory in satisfactory condition. The sample(s) were received undamaged in appropriate containers with the correct preservation.

B. Project Documentation

This project was accompanied by satisfactory Chain of Custody documentation. The sample container label(s) agreed with the Chain of Custody.

C. Analysis of Sample(s)

No analytical anomalies or non-conformances were noted by the laboratory during the processing of these sample(s). All data contained within this report are released without qualification.

Ilivan's Ledge Wetland Monitoring Water Levels

M onitoring Point	Location	T.O.C. Elevation (ft.)	13-Jun-97		14-Jun-00		23-Jul-97		14-Jul-00		15-Aug-97		9-Aug-00		23-Aug-00		27-Oct-01	
			Depth (BGS) [1]	Water Elevation (ft.)	Depth (BGS) [1]	Water Elevation (ft.)	Depth (BGS) [1]	Water Elevation (ft.)	Depth (BGS) [1]	Water Elevation (ft.)	Depth (BGS) [1]	Water Elevation (ft.)	Depth (BGS) [1]	Water Elevation (ft.)	Depth (BGS) [1]	Water Elevation (ft.)	Depth to Water (ft.)	Water Elevation (ft.)
WP-1	Middle Marsh Excav. Limits	66.73	+0.01	63.31	1.49	62.38	0.06	63.24	1.56	62.31	NM	NM	1.12	62.81	1.31	62.62	3.95	62.78
WP-2	Middle Marsh Excav. Limits	65.91	+0.06	63.26	1.31	62.46	+0.06	63.26	2.18	61.59	+0.19	63.39	0.49	62.52	1.30	61.71	3.22	62.69
WP-3	Middle Marsh Excav. Limits	65.91	+0.85	62.85	1.24	62.43	+0.84	62.84	2.32	61.35	+0.94	62.94	0.37	52.54	1.39	61.52	4.06	61.85
WP-5	S. of Middle Marsh	67.01	0.08	64.82	NM	NM	0.30	64.6	NM	NM	0.18	64.72	0.23	64.67	0.36	64.54	NM	NM
WP-6	Former OU-2 Div. Swale	68.06	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	5.05	63.01
MW-7A	S. of Middle Marsh	66.91	From T.O.C.	65.57	NM	NM	From T.O.C.	65.28	NM	NM	From T.O.C.	65.42	From T.O.C.	65.90	From T.O.C.	65.39	NM	NM
MW-9A	Near Mid. Marsh W. of Pond A	66.53	From T.O.C.	61.22	NM	NM	From T.O.C.	62.07	NM	NM	From T.O.C.	62.68	From T.O.C.	62.34	From T.O.C.	61.96	NM	NM
MW-10A	NW. of Area 4 (Adj. Wetlands)	70.54	From T.O.C.	66.76	NM	NM	From T.O.C.	65.62	NM	NM	From T.O.C.	66.17	NM	NM	From T.O.C.	65.71	4.63	65.91
PZ-19	Mitigation Area W. of Pond A	64.89	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	2.94	61.95
PZ-20	Mitigation Area E. of Pond A	65.38	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	2.94	62.44
PZ-21	Former OU-2 Div. Swale	65.48	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	3.88	61.6
PZ-22	Former OU-2 Div. Swale	67.38	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	6.01	61.37
Staff Gauge - 1	Un-named Strm. H Rd. Headwall	70.76 [4]	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		67.20
Staff Gauge - 2	Within Tributary No. 2	69.46 [4]	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		67.20
Staff Gauge - 3	Un-named Strm. Area 4/Adj. Wtlnds	68.78 [4]	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		65.84
Staff Gauge - 4	Un-named Strm. Creat. Chnl, Area 4	69.66 [4]	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		66.28
Staff Gauge - 5	Un-named Strm. Middle Marsh	65.79 [4]	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		63.68
Staff Gauge - 6	W Side of Pond A	63.14 [4]	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		61.35

Notes:

1) BGS = below ground surface; + = water level above ground surface.
2) NM = not measured
3) NI = not Installed
4) Elevation measured at top of green metal post.
5) Water levels measured on June 14, 2000 were taken prior to reopening Un-named Stream through Middle Marsh.
6) Water Levels measured on July 14, 2000 were taken a few days after reopening Un-named Stream through Middle Marsh.

Representative Photographs
Sullivan's Ledge
Wetland Restoration
New Bedford, MA

OU-1 Fairway Pond pre-planting conditions.

OU-1 Fairway Pond 18 months after planting.

OU-1 Middle Marsh pre-planting conditions.

OU-1 Middle Marsh 10 months after planting.

OU-1 Stream Restoration and Creation pre-planting grade.

OU-1 Stream Creation erosion control and BioLogs in place.

OU-1 Stream Creation post-planting.

OU-1 Stream Creation 1 year after planting.

OU-1 Stream Restoration in Middle Marsh erosion control.

OU-1 Stream Restoration in Middle Marsh post-planting.

OU-1 Stream Restoration in Middle Marsh 1 year post-planting

OU-1 Adjacent to Fairway Mitigation (West) planting conditions.

OU-1 Adjacent Fairway Mitigation (East) planting conditions.

OU-1 Adjacent Fairway Mitigation (East) post-planting.

OU-1 Trib 2 planting conditions 1 year earlier.

OU-1 Trib 2 post-planting.

OU-2 Adjacent Wetland planting conditions.

OU-2 Adjacent Wetland 1 year after planting.

OU-2 Middle Marsh planting conditions.

OU-2 Middle Marsh 1 month post-plant installation.

OU-2 Middle Marsh 2 years after installation of plants.

Rodeo application to invasive species within Middle Marsh.

Establishing plant plots and conducting vegetative monitoring.

Rodeo treated Loosestrife along OU-1 Stream in Middle Marsh.